Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Simulated and Measured Electron Thermal Transport with Varying Stochasticity in the MST RFP J.A. REUSCH, J.K. ANDERSON, D.J. DEN HARTOG, F. EBRAHIMI, C.B. FOREST, R. O'CONNELL, D.D. SCHNACK, H.D. STEPHENS, UW - Madison — Recent results show that the MST RFP exhibits Rechester-Rosenbluth thermal transport only at the sawtooth crash, when the MHD activity peaks. This is in contrast with previous results [Biewer, 2003], which suggested stochastic transport between sawteeth. Results from a new set of first principles simulations using the resistive MHD code DEBS will be presented. The simulations are designed to match experimental conditions as closely as possible. Both Spitzer and neoclassical resistivity models were tried for the case of a fixed, experimentally measured resistivity at a central Lundquist number of 3.8×10^6. The measured electron thermal diffusion, χ_e, obtained through power balance is compared to the Rechester-Rosenbluth electron thermal diffusion obtained from DEBS, $\chi_{RR} = v_{T_e} \pi L_{eff} \tilde{b}^2 / B^2$, and the expected thermal diffusion from the field line tracing code MAgnetic Lines (MAL), $\chi_{MAL} = v_{T_e} D_{mag}$ where $D_{mag} = (\Delta r)^2 / (2\Delta l)$, where the traced magnetic field is also from DEBS. χ_{RR} is generally found to be an order of magnitude larger than χ_e except at the sawtooth crash, where the two are in agreement, suggesting that while magnetic fluctuations are always the dominant transport mechanism, the magnetic field is only fully stochastic at the sawtooth crash. This work is supported by the U.S. DOE.

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Date submitted: 16 Jul 2009 Electronic form version 1.4